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JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 3 November, 1901 No. 35

# ALBINO FRUIT OF VACCINIUMS IN NEW ENGLAND.

WALTER DEANE.

MISS HELEN F. AYRES of Medford, Massachusetts, has sent me specimens of a white-berried blueberry, *Vaccinium pennsylvanicum*, Lam., collected by her in the town of Fitzwilliam, New Hampshire, and she has also kindly furnished me with such full information in regard to the plant and its surroundings that I am enabled to make the following note. The bushes grow in a pasture and cover a space of about one square rod. The pasture in this locality is on a side hill and the soil is not rocky but rather dry. Some of the bushes are under the shade of the neighboring trees, while others are exposed to the sun. The plants are from six to eight inches tall and have been growing on this spot year after year for a long time, one bush having been found here about twenty years ago. There are now about twenty bushes in all and they bear only white berries, no other bushes in the town bearing berries of this color. A number of bushes of the typical *Vaccinium pennsylvanicum* are growing among the white-berried forms, and in the neighborhood are found various kinds of blueberries, *Vaccinium corymbosum* and its variety *atrococcum*, *V. pennsylvanicum*, which comprises nine-tenths of the berries in the pasture, and its variety *nigrum*, besides the common huckleberry, *Gaylussacia resinosa*, a plant not common in Fitzwilliam. The pasture supports a luxuriant growth of thistles, evening primroses, chokeberries and other plants which crowd the ground.

Miss Ayres sent me fresh specimens of the white-berried blueberry and other interesting forms growing near. They were gathered by her on August 15 last, on which day the white berries were falling rapidly, though the others still remained on the bushes. I received

these specimens on the next day, the 16th, and was thus enabled to make observations on them as if I had picked them on the spot. In the white-fruited form the berries were fully ripe and very sweet in comparison with those of the type, and the skin was very thin. They were translucent and the color was a creamy white, while in most cases the berries had a light rosy tinge on the side exposed to the sun. The calyx tips in many cases were of a light pinkish color, but in other respects the plant was typical.

Messrs. E. L. Rand and J. H. Redfield have recorded white-berried plants of this species from Mount Desert, Maine (Flora of Mount Desert, Maine, 1894, p. 124). Mr. Rand tells me that he found the plant on Jordan Mountain, September 2, 1892, and that the fruit was of a dull white, tinged with red, especially at the apex, but not pure albino. He has sent me specimens. These instances of white-fruited *Vaccinium pennsylvanicum* are the only ones that I am acquainted with from New England. Prof. Thos. C. Porter in 1894 (Bull. Torr. Club, XXI, pp. 121, 122) reported white-berried forms of this same species from Monroe County, Pennsylvania, and according to the precedent of Prof. Britton's *Gaylussacia resinosa*, forma *leucocarpa* (Bull. Torr. Club, XVII, 1890, p. 125) I will designate this form *Vaccinium pennsylvanicum*, forma **leucocarpum**. Its continued occurrence for so many years in the same place entitles it to some formal recognition. In my list of New England *Ericaceae* (RHODORA 1, 1899, p. 94) this form should be entered with a cross for New Hampshire and Maine.

I examined carefully the other specimens of *Vaccinium pennsylvanicum* growing near forma *leucocarpa* and I will record briefly the results. There are five forms: — 1, The typical form, berries black with heavy bloom, taste normal; 2, berries black with slight bloom, taste as in no. 1, rest of the plant typical; 3, berries black without bloom, taste as in no. 1, but leaves hirsute below on the midrib, oblong lanceolate, shining on both sides, twigs warty as in the type; 4, berries dull red without bloom, taste insipid, plant otherwise typical; 5, berries dark red with bloom, taste insipid, plant otherwise typical. In all these cases the fruit was perfectly ripe. These five forms I would regard as merely individual variations whose persistency has yet to be proved. (See also Flora of Mount Desert, Maine, 1894, p. 124.)

I received from Mr. Arthur S. Pease of Andover, Massachusetts, on July 28 last, fresh specimens of *Vaccinium corymbosum*, var. *atrococcum*

(a variety of our high bush blueberry) with white berries collected by him in Andover on July 27. The berries were translucent and of a creamy white color, the skin was very thin, but the taste, unlike that of the white-berried form described above, was insipid. Mr. Pease, in the letters of information which he kindly wrote me, says, "There is only one bush, growing on a hillside among bushes of the type and var. *atrococcum*. The bush is about five or six feet high and does not seem to differ at all from the bushes about it..... The insipid taste in the berries which you remarked upon I myself noticed, as did all the other persons who tasted the berries that I gathered— I find that berries of this sort have been gathered in this locality for at least eight or ten years and perhaps longer." The persistency of this white-fruited blueberry seems to entitle it to recognition as *Vaccinium corymbosum*, var. *atrococcum*, forma **leucococcum**. It should be entered on my list with a cross for Massachusetts. All the specimens described above by me from fresh material are in my herbarium.

Mr. William Brewster tells me that there is a high bush blueberry, *Vaccinium corymbosum*, L., bearing white berries on his farm in Concord, Massachusetts. Local tradition affirms that this bush has fruited many years.

Mr. E. L. Rand has kindly shown me specimens of a white-fruited Canada blueberry, *Vaccinium canadense*, Kalm., collected by Miss Harriet A. Hill of Belmont, Massachusetts, early in September, 1901, in Gouldsboro, Maine. Captain George Allen of Gouldsboro told Miss Hill of the blueberries and conducted her to the locality. I will quote the following from Miss Hill's letter to Mr. Rand describing the situation: —

"We went up a slight rise of land to a small clearing where there was a thick growth of the Canada blueberry, mountain cranberry, brakes, golden-rod, etc. All around was a scattering growth of spruces, canoe birches, yellow birches and balsam firs. In the middle of the clearing on the westerly slope of the ridge we found a patch about ten feet square of the white Canada blueberry, surrounded on all sides by the common variety. So far as we could see there was no difference in the soil or the environment of the two varieties. They grew side by side yet each perfectly distinct. Capt. Allen told us that they had been there ever since he could remember." Mr. Rand has seen fresh fruit from this locality and he describes the color of the ripe berries as a dead waxy white, that of the unripe fruit being a

yellowish hue. From my examination of the specimens the plant is in all other respects typical. I will designate it *Vaccinium canadense*, forma **chiococcum**.

Prof. Wm. G. Farlow records white-fruited *Vaccinium canadense* from Shelburne, New Hampshire (Garden and Forest, II, 1889, pp. 50, 51). This form should be entered in my list with a cross for Maine and a line for New Hampshire.

I will mention two records outside of New England. *Vaccinium vacillans* with white berries is recorded from the sand region east of Chicago, Illinois, by Mr. E. J. Hill (Garden and Forest, VIII, 1895, p. 503). He says that the plants are known to the berry pickers, thus indicating that the form is a persistent one, and he thinks that the seeds are fertile.

Prof. Thos. C. Porter in 1889 (Bull. Torr. Club, XVI, p. 21) records white-berried *Gaylussacia resinosa* from Pennsylvania and New Jersey.

The writer will be very glad to hear of any other stations in New England or elsewhere for white-berried forms of *Vaccinium* or *Gaylussacia*.

CAMBRIDGE, MASSACHUSETTS.

## MISCELLANEOUS NOTES ON NEW ENGLAND FERNS,— II.

GEORGE E. DAVENPORT.

3. In the course of these notes some important changes will be adopted, but in all cases such explanations will be given as will render the reasons therefore clearly understood.

For instance: — The Lady fern, until quite recently, has been known to American fern students as *Asplenium filix-foemina* although Prof. Eaton, and Dr. Underwood have recognized Roth's *Athyrium* as a section of *Asplenium* in accordance with the treatment of Hooker and Baker.

Many excellent authorities, however, have regarded *Athyrium* as wholly distinct from *Asplenium* and kept the two apart. The former appears to be well represented by a group of ferns quite distinct in habit, structure and the character of their sori from *Asplenium*

as now understood, and there appears to be a steadily increasing tendency towards its more general recognition.

The latter genus (*Asplenium*), as defined by Linnaeus, originally embraced all ferns with their sori arranged in lines diverging from the midribs, but in, or about 1800 (exact date uncertain), Roth[1] noticed that certain species of *Asplenium* produced a large proportion of peculiarly curved sori mixed with the regular straight (asplenioid) form, and deeming this to be of sufficient importance to constitute a new generic character, he founded upon it his genus *Athyrium*. As the special character of the athyrioid sori is the subject of the following note there is no need of dwelling on it further here, but it is a little singular that the very first species mentioned by Roth, *A. fontanum*, under his new genus should have asplenioid sori, so that if it were not for the clear and unmistakable description of the *semi-lunar* sori as he called them in his text, and his explicit declaration that it was these *semi-lunar* sori which led him to propose a new genus, the validity of the genus itself might be seriously questioned.

John Smith (in "Historia Filicum") says of it that it is better represented by the habits and character of the ferns comprising it than by the shape of the sori, but Moore more correctly apprehended Roth's views in saying that the genus is best known by the character of its peculiar sori.

Probably the truth of the matter may be in the combination of all of these characters, as it is certain that true *Athyria* may be quite as readily distinguished from *Asplenium* by their habits, and the more compound structure of the fronds as by the peculiarities of their sori. This combination of characters may readily be seen in the Lady fern, and as the athyrioid sori largely predominate in that species it has become the accepted type for *Athyrium*.

[1] The genus *Athyrium* was first published by Albrecht Wilhelm Roth in Tentamen Florae Germanicae, "which was published in three volumes extending from 1788 to 1800. The Ferns were published in Volume 3, which is dated 1800, but Pfeiffer cites 1797, and 1798 is sometimes given as the date when the genus was first proposed, that being the date of the Preface (Sept. 14). According to Dr. Underwood (see an excellent historical "Review of the Genera of Ferns," reprinted from Memoirs Torrey Botanical Club, 1899) Bernhardi quoted Roth's genera in 1799, which would indicate an earlier appearance than the date of the volume itself.

The name *Athyrium* is derived by Wittstein (*Etymologisch-botanisches Handwörterbuch*, 83) from ἀ privative and θυρεός, a shield, on the ground that Roth must have meant that the sorus having the indusium solely on one side, is in a sense without a shield. Lowe (Our Native Ferns, ii. p. 4) inclines to the belief that the name is from the Greek "Athyros — opened."

In addition to the characters mentioned, Dr. Milde laid much stress on the character of the fibro-vascular bundles in the stipe, and it is certain that in *A. filix-foemina*, at least, the two somewhat crescent-shaped bundles in the lower portion of the stipe are partially crooked at the upper ends and retain a partial resemblance to the hamate form of the sori, even after the bundles themselves become united in the upper portion of the stipe and rachis, into the single U-shaped form.

The genus is pretty generally accepted abroad at the present time, and has been adopted in this country by Shimek, Maxon, Clute and Gilbert in their recent publications. On this account I have decided, after mature deliberation, to adopt it myself, as this seems to be one of those instances where the general concensus of views among the best authorities should prevail. Accordingly the subject of the following note will be designated as *Athyrium filix-foemina*, instead of *Asplenium filix-foemina* as heretofore.

4. The Indusium of Athyrium filix-foemina, Roth (Tent. Fl. Ger., iii, 65). — During the early months of the present year (1901) I devoted a great deal of time to an examination of the early states of the sori in *Athyrium filix-foemina*, principally for the purpose of comparisons between the common forms of the Lady fern and the California plant known as *A. cyclosorum*, which has the margins of the indusia in their early states ciliated with jointed hairs (B. D. Gilbert).

The indusium of *A. filix-foemina* is variously described and figured by different authors whose descriptions and figures do not always agree. Generally the indusium is described as having a jagged or toothed margin fringed with cilia, even when the figures represent an entire, or nearly entire margin. These discrepancies are due to the great diversity in the character of the species itself, specimens of which vary according to their form or age. But according to the majority of descriptions the indusium has a lacerated and ciliated margin, and such a character is figured by good authorities as the type form for the species.

Yet during the months of May and June, I examined many hundreds of fronds in all stages of development without once finding any such type.

In the greater number of sori examined the margin of the indusium was either entire, or only very slightly erose, or sinuately notched, so

that it began to look as if some unusually extreme condition had been selected for the type form.

Finally, however, I began to find some ciliated indusia, and well into July both Miss Slosson and myself found lacerated and ciliated indusia in abundance. Thus contrary to my expectation of finding ciliated margins on the earliest fronds as appears to be the case with the California *cyclosorum*, they were not found until the later fronds of midsummer developed.

About the middle of July Miss Slosson sent to me from Mattapoisett some fresh specimens with a large percentage of ciliated indusia, but as I was unable at the time to give them an immediate examination the specimens were put under a loose pressure for temporary preservation, and when taken out later on were found to be apparently without cilia, the cilia having either dried up, or become rubbed off through pressure. This shows them to be extremely fugacious. It is certain also that when present in nature they gradually disappear as the sori mature, so that beyond a certain stage of development they are seldom seen. It is also certain that they occur more abundantly on some forms than on others, but I am convinced that so far as our New England forms are concerned they should not be figured as the type form for the species without at least some clearer explanations than are usually given.

The sori in *Athyrium filix-foemina* exhibit three well marked forms, the first being nearly straight or slightly curved on the back, as in true *Asplenium*; the second being partially recurved at one end like a Bishop's crook, and the third being wholly recurved like a horseshoe in shape. In the latter form the two ends approach each other so closely as to make the sorus appear reniform, as in *Nephrodium*, for which specimens have sometimes been mistaken. In some of the more delicate small field and woodland forms the small roundish matured sori look so much like those of *Phegopteris* that specimens are often very puzzling to novices, but a little attention to the cutting of the frond, and the venation, will soon overcome the difficulty. There is, too, an indefinable charm about the various forms of the Lady fern which soon enables one to know it from its peculiarly graceful motion by merely gently swaying a frond in the hand.

In all three forms of the sori the indusium may be either entire, sinuated, toothed or jagged, and either with or without the hairlike projections called *cilia*, which gradually disappear with age.

The different forms of the sori are technically designated as first, *linear*, or straight (*asplenioid*); second *hamate*, i. e., like a Bishop's crook, or staff, and third *hippocrepiform*, in shape like a horseshoe, the two latter forms being *athyrioid* in character.

All three of these forms occur in greater or less proportions on the same plant, and even on the same frond, but the hamate and hippocrepiform sori occur in greater proportion on some forms than on others, and it was the preponderance of such forms that led Roth to found the genus.

From all this it will be seen that *Athyrium* is chiefly characterized by the production of *hamate* and *hippocrepiform* sori, and that *Athyrium filix-foemina* is its best type.

The only other member of the genus in New England is *Athyrium thelypteroides*, Desvaux, which may be the subject of another note later on.

MEDFORD, MASSACHUSETTS.

## THE NORTH AMERICAN EUPHRASIAS.

B. L. ROBINSON.

IT has long been recognized by New England botanists that the attractive little Eyebrights of our northern borders present much more diversity than is indicated in current floras. The appearance of Prof. von Wettstein's elaborate monograph of the genus Euphrasia, published in 1896, was, therefore, a matter of much interest and many efforts have been made to bring our forms under the species of the New and Old World therein so carefully described. However, the results have been only partially successful. It is true that the separation of *E. latifolia* of arctic America and the specific distinction of the diminutive *E. Oakesii* of the White Mountains have given some relief to the traditional and overcrowded *E. officinalis*, but even with the addition of *E. americana*, Wettst. and the later *E. canadensis*, Townsend, it has still been impossible to find satisfactory categories for several of our forms. This has arisen from no lack of clearness in the detailed descriptions and excellent key of the monograph but from the evident fact that its author, while able to examine a great

wealth of Old World material was obliged to draw his inferences regarding the American species from comparatively few and inadequate specimens. During last August the writer in company with Mr. E. F. Williams was able to secure on Mt. Washington specimens of the alpine forms there represented and these together with excellent material from the St. John valley in northern Maine, some very interesting forms from Mt. Desert Island secured by E. L. Rand, Esq., and the miscellaneous specimens which have long been accumulating in the Gray Herbarium, have seemed to warrant the present attempt to coördinate our American forms. It must be confessed, however, that the present restricted range of several species, the nearness of others to Old World forms, and the difficulty of clearly delimiting the arctic species, all suggest the probability that considerable further collecting and observation will be necessary before a definite settlement of the group can be attained.

According to Wettstein's treatment the genus Euphrasia contains about 90 species, of which 19 are Australian, 14 South American, and the remainder of the northern temperate and arctic zones, occurring chiefly in mountainous and boreal regions. Wettstein regards the following species as exclusively American: *E. Oakesii* and *E. americana*, to which may be added the later published *E. canadensis*, Townsend,—while *E. latifolia*, and *E. mollis* are treated in the monograph as common to certain portions of both continents. The possible occurrence of *E. hirtella* in America as merely conjectured. All these species are annuals and belong to Wettstein's first series, the *Parviflorae*, which includes also the majority of the rather numerous and difficult species of central Europe and the British Isles.

## Synopsis of Species.

* Flowers very small, borne in a compact leafy head or very short dense subcapitate raceme: dwarf arctic and alpine species with stems normally simple: corolla dorsally 3 to 4 mm. long.

\+ Leaves gray pubescent beneath.

++ Calyx-teeth straight or nearly so: flowers shortly racemose: Alaskan.

E. MOLLIS, Wettstein, Monog. d. Gatt. Euphrasia, 141 t. 4, f. 205–210, t. 12, f. 5 (1896). *E. officinalis*, var. *mollis*, Ledeb. Fl. Ross. iii. 263 (1849). Leaves gray-hirsute upon both surfaces, especially upon the nerves beneath, the lower ovate, deeply crenate-toothed,

the upper and floral suborbicular with obtuse, obtusish, or scarcely acute teeth: calyx-teeth rather broad, flat, subacute, densely pubescent: corolla very small, white or purple with deeper-colored veins.— Alaska, the Aleutian Ids., and Kamtchatka acc. to Wettstein. To this species may be referred Mr. J. M. Macoun's no. 154 from Behring Isl. The species seems difficult to separate satisfactorily from *E. latifolia*, Pursh. The latter, however, is less hirsute, often glandular, more inclined to branch, and has slightly larger flowers.

++ ++ Calyx-teeth recurved: flowers capitate: corolla white with violet veins and yellow eye: White Mountains of New Hampshire, and (?) Mt. Katahdin, Maine.

E. Oakesii, Wettst. l. c. 142, t. 4, f 211 to 215, t. 12, f 6, & in Bot. Gaz. xxii. 401; Britton & Brown, Illust. Fl. iii. 182, f. 3327 (excellent). *E. officinalis*, var. *tatarica*, Wats. & Coult. in Gray, Man. ed. 6, 392, in part. Very dwarf, 2 to 5 cm. high, the filiform erect or often decumbent simple stem bearing 1 to 4 pairs of small ovate-orbicular leaves below the dense globular leafy inflorescence (about 1 cm. in diameter): leaves and bracts finely pubescent upon both surfaces, the teeth 5 to 9, very blunt and separated by rounded sinuses: calyx pubescent, the teeth slightly indurated, curved outward in varying degrees or even reflexed: corolla so small as to be inconspicuous even in anthesis, nearly or quite white, marked with deep bluish violet veins and yellow eye.— Alpine region of the White Mountains, *Oakes*; *W. H. Manning*, 9 Aug. 1881; along the Crawford trail, near the head of Oakes Gulf and Mt. Munroe, 28 Aug. 1877, and 18 Sept. 1891, *E. Faxon*, 20 Aug. 1891, 31 July, 1893, *G. G. Kennedy*, also in the same locality, 4 Aug. 1901, *E. F. Williams & B. L. Robinson*. Growing in abundance in dry stony soil with *Potentilla frigida*, etc. While it is not possible to say with certainty that the locality particularly mentioned, which is on the western side of Mt. Washington toward Mt. Monroe is the one in which the original material was obtained by Oakes, it is now the only locality where this plant is known to grow in the White Mountains and it is altogether likely that it is the type station. Immature and doubtful plants apparently of this species were collected on Mt. Katahdin, altitude 1225 to 1375 m., 14 July, 1900, by M. L. Fernald (Rhodora, iii. 176).

+- +- Leaves more or less ciliolate and minutely setulose upon the upper surface near the margin (under a lens), otherwise essentially glabrous: corolla brownish purple with a yellow eye.

**E. Williamsii.** Dwarf, 3 to 10 cm. high; stem erect, simple, filiform, purplish, covered with short crisped white hairs and bearing beneath the terminal dense leafy head 3 to 5 pairs of leaves: leaves green with slight bronze tinge above, 5 to 8 mm. long, ciliolate, otherwise essentially glabrous, the lowest ovate-oblong, 7-toothed,

the middle somewhat larger, ovate, the floral obovate to flabelliform or suborbicular, closely approximated in a dense head; teeth 7 to 9, short, triangular, acutish, the terminal tooth of each floral leaf broader and more obtuse but mucronulate; the sinuses acute or at least not conspicuously rounded: flowers very small, confined to the terminal subglobose head and one or two of the upper axils just beneath it: calyx 4 mm. long, the teeth lanceolate, ciliolate with very short and inconspicuous hairs and terminating in a narrow somewhat uncinate point: corolla brownish purple, 3.5 to 4 mm. long dorsally, its pubescence minute and visible only with a strong lens; lips about equal in length, the lower paler in color and internally marked by a small yellow eye: capsule elliptical, ciliate toward the obcordate summit, otherwise glabrous.— Eastern slopes of Mt. Washington, New Hampshire, alpine region, stony ground and crevices of rock on the "Alpine Garden" at the head of Raymond's Ravine and of Huntington Ravine, 5 Aug. 1901, *E. F. Williams & B. L. Robinson* (type); ledges near the 5th mile post on the spur known as "Cape Horn," 6 Aug. 1896, *E. Faxon & E. F. Williams*; at the same locality 6 Aug. 1901, *E. F. Williams & B. L. Robinson.*

This species possesses a close habital similarity to the preceding and in the dried state might easily be confused with it, unless the very different pubescence were noticed. In a fresh state, however, the deep brownish purple corolla and greener foliage readily distinguish it from *E. Oakesii.* There are also minor differences in the sinuses between the teeth of the leaves, smoother less uncinate calyx-teeth, etc. Mr. Williams and the author examined about six hundred individuals of this species and more than a thousand of *E. Oakesii*, but could detect no intermediates.

* * Flowers very small (corolla 3 to 4 mm. long), borne in long open racemes; stems simple or few-branched: leaves small, bluntly toothed, pubescent on the veins beneath.

**E. Randii.** Simple or few-branched from near the base or (rarely) much branched throughout, erect or decumbent, 3 to 12 cm. high; stem purple, covered with very short recurved white hairs and bearing 10 to 13 pairs of leaves (separated by short internodes of nearly uniform length) and a small terminal dense leafy head: leaves suborbicular, 9–11-toothed, the larger 7 to 9 mm. long, broadly subcordate, finely subappressed-pubescent upon the dark green rugose upper surface, setulose upon the prominent veins of the paler lower surface, the teeth obtuse or barely acute, not aristate, all pairs of leaves, except one or two of the lowest floriferous in one or both axils: flowers small, subsessile: calyx pubescent, 3.5 mm. long; the teeth triangular, lanceolate, flattish and nearly or quite straight, finely pubescent upon both surfaces: corolla cream-colored with reddish veins to deep purple or violet, marked with still deeper veins, greenish toward the base, nearly glabrous; lips short, about equal:

capsule elliptic-oblong, ciliate and obcordate at the summit.— Grassy and sedgy places on Mt. Desert Island, Maine, and the smaller islands adjacent, as follows: Great Cranberry Isle, 17 July, 1897, *E. L. Rand* (types, in hb. Gray and hb. E. L. Rand), 17 July, 1896, *E. L. Rand*, 20 July, 1899, *E. L. Rand & E. F. Williams*; Mt. Desert Isl., on the "Sea Wall," 26 July, 1892, *E. L. Rand*; Baker Isl., 22 July, 1899, 22 July, 1901, *E. L. Rand*; Great Duck Isl., 12 July, 1901, *E. L. Rand*; near seashore, Cutler, Maine, 13 July, 1901, *G. G. Kennedy*.

This species differs from *E. Oakesii* in its greater stature, tendency to branch, broader and straightish calyx-teeth, apparently deeper colored corolla, and especially in the open spicate raceme, which begins from the second or third node and is much elongated even during anthesis. In *E. Oakesii* on the contrary the inflorescence remains capitate even to ripe fruit. *E. Randii* differs from *E. Williamsii* similarly in inflorescence and also in its much more copious pubescence. It appears to stand close to *E. micrantha*, Brenn. of Lapland, which, however, is said to have a glabrate calyx and white corolla with dark veins.

Var. (?) **Farlowii**. Leaves smaller, 2 to 4 mm. long, thicker, only 5–7-toothed: pubescence coarser and more spreading. — Dog Island, Eastport, Maine, September, 1877, *W. G. Farlow*. This is a puzzling form which more copious material may show to be a distinct species.

* * * Flowers larger: corolla dorsally 5 to 7 mm. long, white with bluish purple or violet veins and yellow eye.

+ Leaves conspicuously pubescent, glandular hairs being often interspersed with the non-glandular; teeth obtuse to acute (in the upper and floral), not at all aristate or scarcely so.

E. latifolia, Pursh, Fl. Am. Sept., ii. 430 (1814); Wettst. Monog. 136, 298, t. 4, f. 194–199, t. 11, f. 11. 12; not Willd.; *E. officinalis*, var. *latifolia*, Britton, Mem. Torr. Club, v. 296 (1894), and *E. latifolia* Britton & Brown, Illust. Fl. iii. 181, 182 (but fig. 3325 uncharacteristic and name contrary to the Rochester Code); *E. officinalis*, var. *tatarica*, Benth. in DC. Prodr. x. 552, in part. — Dwarf or rarely tall, 4 to 12 (or more) cm. high: foliar leaves 2 to 4 pairs, broadly ovate, obtuse and with 2 to 5 bluntish teeth on each side, pubescent with (for the genus) rather long although often sparse non-glandular hairs; floral leaves larger, more deeply and sharply toothed but not aristate, commonly glandular as well as covered by a rather copious non-glandular pubescence, not plicate even in dried specimens: flowers closely aggregated at the ends of the stem, but the inflorescence at length becoming lax below.— Northern Maine, upper St. John valley, *G. L. Goodale*. Labrador, Hopedale, Bowdoin Coll. Exped. no. 242, also *J. D. Sornborger*, no. 82; Rama, *A. Stecker*, no. 343; also Alaska, Kamtchatka, and Lapland, *Andersson*.

E. HIRTELLA, Jordan in Reuter, Compt. Rend. Soc. Haller. iv. 120 (1854–1856), acc. to Wettst. Monog. 175, t. 4, f. 278–290, t. 8, f. 4–7. — Very similar to the preceding but less arctic in habitat and less dwarfed in habit, 5 to 18 cm. high, often branched: stem-leaves ovate-oblong, cuneate, obtusely toothed; bracts ovate, very sharply or acuminately 5–8-toothed on each side, narrower and less imbricated than in the preceding, strongly pubescent and glandular: calyx, corolla, and capsule much as in the preceding. — North shore of Lake Superior, 1848, *L. Agassiz*, 1879, *T. S. Roberts*; Isle Royal, 1849, *Whitney*; Good Harbor, Minnesota, 14 August, 1868, *H. Gillman*; Hudson Bay, *Burke*; Rocky Mountains of British America, *Drummond.*

While Wettstein credits this species to America doubtfully and only upon the basis of some mixed material in the herbarium of the Royal Gardens at Berlin, there can be little doubt of the entire correctness of his view for the specimens above cited agree well not only with descriptions and figures of *E. hirtella* but also with Old World specimens of it.

On page 191 of his monograph Wettstein cites *E. Rostkoviana*, Hayne, as examined from Quebec (*Canby*), but as this occurrence is not mentioned in his later list of American species (Bot. Gaz. xxii. 401), it is probable that it rested upon a determination which was doubted or latered in the interim. The writer has seen no plant from any part of America which combined the large corolla and copious pubescence which are together characteristic of *E. Rostkoviana.*

++ Leaves glabrous or bearing only some very minute hairs at the margin and on the veins beneath, the floral bracts often minutely glandular-puberulent.

E. AMERICANA, Wettst. Monog. 127 (1896); Bot. Gaz. xxii. 401. — Rather tall, considerably branched above, the stem covered with fine short crisped reflexed white hairs, the branches elongating into rather loose spicate-racemose inflorescences: lower and middle leaves ovate or ovate-oblong, not strongly plicate, 3–5-toothed on each side, the upper teeth obtuse, the lower acute, becoming in the upper and floral leaves very sharp and decidedly aristate at the tip; more or less fine glandular puberulence often present: corolla 5 to 6 mm. long dorsally. — QUEBEC, *Canby*, acc. to Wettstein: NOVA SCOTIA, Cape Breton Isl., *W. Faxon*: NEW BRUNSWICK, St. John, *Matthew*, acc. to Wettstein; Lily Lake, St. John, 8 August, 1873, *Wm. Boott*; Campobello, September, 1898, *W. G. Farlow*: MAINE, Machias, *J. W. Chickering*; Machiasport, *M. A. Barber*; mossy roadside in woods, Cutler, 16 July, 1901, *G. G. Kennedy*; Mt. Desert Isl., Southwest Harbor, 15 Aug., 1888, 30 Aug., 1890, 28 Aug., 1891, 26 July, 1892, *E. L. Rand*; 19 Sept., 1892, *M. L. Fernald*; Great Cranberry Isle., 20 Aug., 1888, 18 July, 1894, 17 July, 1896, 17 July, 1897, 16 July,

1898, *E. L. Rand*; 10 July, 1894, *E. Faxon*; 7 July, 1890, *J. H. Redfield*, *E. F. Williams*; 20 July, 1899, *E. F. Williams*; Black Isl., 20 July, 1894, *J. H. Redfield*. These plants of Mt. Desert are in many instances tall forms, growing in long grass, branching above, and with inflorescences at first short-cylindric and compact but at length loose and considerably elongated. Complete transitions may be found to the following variety or form growing in short grass or in drier and more sterile places.

Var. **canadensis**. *E. canadensis*, Townsend, Journ. Bot. xxvii, 1, t. 381 (1898).—Closely similar in foliage and flowers: stem low, branched from near the base, densely floriferous from considerably below the middle: floral bracts sometimes with and sometimes destitute of minute glandular pubescence.—Quebec, on grassy hills near the city, 1891, *F. Townsend*; Plains of Abraham, *J. Blake*: Ha Ha Bay, *G. G. Kennedy*: Maine, in short grass, Frenchville, 12 Aug., 1901, *E. F. Williams, M. L. Fernald & B. L. Robinson*; Great Duck Isl., 9 Aug., 1893, *J. H. Redfield*, 12 July, 1901, *E. L. Rand*; Baker Isl., 22 July, 1901, *E. L. Rand*; New Hampshire, White Mountains, at lower altitudes, Glen House, 28 July, 1865, *Wm. Boott*; 18 July, 1891, *G. G. Kennedy*; roadsides at base of Mt. Washington 10 Aug., 1878, *J. A. Allen*. The White Mountain plants are slender forms of sterile soil.

Gray Herbarium.

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Solanum rostratum in Central Maine.—I note that all published records of the occurrence of *Solanum rostratum* Dunal in this State are from the other side of the Kennebec River, or at least I have seen no record of its occurrence nearer than Gardiner. To-day (Sept. 22, 1901) I collected specimens of this species in the rear of some farm buildings a short distance out of Bangor. This species seems to be becoming established throughout the State as it has spread widely since first found in 1896.

I have in my collection at present a fragment of a specimen which was sent to the University of Maine for identification in Sept., 1896, by Mr. C. C. Call of Buxton. I feel sure this was the first instance of its occurrence in the State being known, and record was made at the time by the late Prof. Harvey.—O. W. Knight, Bangor, Maine.

# TREE WILLOWS AT FORT KENT, MAINE.

Emile F. Williams.

The St. John river, where it forms the northernmost boundary of Maine between St. Francis and Hamlin, has already been most prolific in botanical rarities, but that its resources are by no means exhausted was demonstrated very forcibly during the short botanical trip made there last August by Dr. B. L. Robinson, Mr. M. L. Fernald and myself. Many most interesting plants were collected and these will be noticed in due time in this journal, but I wish in this instance to call attention to some remarkable willows which we found growing in a hillside bog at Fort Kent.

*Salix discolor* assumed here the habit and proportions of a fair sized tree. The trunk of one specimen measured forty-three inches in circumference at two feet from the ground. *S. balsamifera*, which I believe has always been considered a shrub, here attained a diameter of fourteen inches at two feet from the base. Like *S. discolor* it assumed a tree-like habit and both these species were represented by specimens not less than twenty to twenty-five feet high. Another willow proves to be of more than usual interest. I collected specimens from a tree measuring seventeen inches in circumference at two feet from the ground and not less than twenty-five feet high on July 22nd, 1900, with Mr. J. Franklin Collins of Brown University. We referred these last winter to *S. pentandra* of Europe and northern Asia, but rather doubtfully as the station where they were collected hardly seemed likely to harbor introduced species. We paid a visit to these trees on August 10th, 1901, and collected more material which has been critically examined by Mr. Fernald, who pronounces it to be *S. lucida*, Muhl., var. *macrophylla*, Andersson.

Andersson described this variety in his monograph of Salix (DC., Prodromus, XVI, Part 2, 205) from a specimen of Lyall's, collected in 1859 on the Frazer river (British Columbia) and from a specimen of Bourgeau's from Rio River (presumably in the Saskatchewan country). Fortunately there is a good full specimen of Lyall's in the Gray Herbarium and it matches exactly our material.

The important characters separating it from the ordinary *S. lucida*, in which the leaves when mature are quite glabrous, are the closely pubescent branchlets with an only occasional tendency to become

smooth and the very large taper-pointed leaves with the midrib pubescent both above and below, usually densely so even in late summer. Many leaves in my specimens are over six inches long.

Thus one more high northern plant is added to the Flora of the United States by its occurrence in the valley of the St. John river within our border.

Boston, Massachusetts.

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A New Station for Lactuca Morssii. — Among a number of specimens of *Lactuca leucophaea*, Gray, which I collected in Middleboro, Mass., on Aug. 18, 1901, there was one which, on examination, proved to have fruit unlike that of the others. This specimen has been identified at the Gray Herbarium as *L. Morssii*, Robinson. The plants came from a rather low place by the roadside, near a brook. Except for the fruit, there was no apparent difference between the species. This station extends the range of *L. Morssii* by about twenty miles, and is at least ten miles from the nearest salt water. — John Murdoch, Jr., Roxbury, Massachusetts.

## THE TRUE LYCOPODIUM COMPLANATUM AND ITS COMMON AMERICAN REPRESENTATIVE.

M. L. Fernald.

In August, 1901, while studying the forms of *Lycopodium sabinaefolium* and *sitchense* on a northern hillside at Fort Kent, Maine, Mr. E. F. Williams called the attention of Dr. B. L. Robinson and the writer to a peculiar coarse plant with more or less glaucous branches. This plant which at first sight suggested a large glaucous form of *L. sabinaefolium* was seen upon examination to differ strikingly from that species in its broad branches with flat under surface. In this character the plant was like the common *L. complanatum* of the Eastern States. But unlike the well-known eastern *L. complanatum*, which occurred near by, the coarser glaucous plant quite lacked the compact fan-like habit of the sterile branches, while the longer loosely ascending branches were less forked, and the shorter mostly simple peduncles bore solitary simple or slightly forked strobiles

whose lowermost scales were often remote, grading imperceptibly into the scales of the peduncle.

Later, in September, the writer found in spruce woods at Island Falls (about ninety miles south of Fort Kent) a much larger development of the loosely branching plant. Here, however, the very long and loose branches were dark green and not glaucous; but, otherwise, in its broad, elongated, slightly forking branches and solitary or paired strobiles the Island Falls plant was undoubtedly to be identified with the more glaucous material from Fort Kent.

A comparison of the Maine specimens shows this plant to be of broad range in North America — from Newfoundland and Labrador to Alaska, south to the Great Lakes and the Rocky Mountains. This, as shown by the specimens then cited, is the plant described, without name, in 1900 by Lloyd and Underwood as a peculiar northwestern form of *L. complanatum*; while as the typical form of the species was cited the common eastern plant with "regular compact fan-like habit." They found, "however, at present only insufficient reasons for giving distinct specific rank to these plants," and, furthermore, that "*L. complanatum*, as it grows in Scandinavia, seems to parallel the northwestern condition of the American plant."

As represented in the Gray Herbarium the Scandinavian material of *Lycopodium complanatum* is not alone in resembling the "northwestern condition of the American plant." In fact, all the European and most of the Asiatic specimens examined are inseparable from the loosely branched plant found in northern Maine and described by Lloyd and Underwood from the northwest. This is the plant generally accepted by European authors as *Lycopodium complanatum* and it is well illustrated in Flora Danica, xv. t. 2671, and Journal of Botany, xx. t. 233. In fact, none of the Old World material examined (with the possible exception of a doubtful plant from Sachalin) shows the "compact fan-like habit" of the common plant of eastern America. In the European material the number of strobiles varies from 1 to 5, but peduncles bearing 1 or 2 occur most frequently. Of 208 peduncles examined 92 have 1 strobile, 88 have 2, 22 have 3, 5 have 4, and 1 has 5, with an average of 1.7 strobiles for each peduncle.

The *Lycopodium complanatum* of Linnaeus was a complex. The descriptive phrase in the Species Plantarum "spicis *geminis* pedunculatis" and the first cited references, to Flora Lapponica and Flora Suecica, show very definitely that he had in mind the common plant

of northern Europe. The last plant cited by him, however, the "Lycopodium digitatum foliis Arboris Vitae, spicis *bigemellis* teretibus" of Dillenius, was the common plant of eastern America, as is shown very clearly by the plate of Dillenius drawn from a Pennsylvania specimen collected by John Bartram. This citation (at the last of his description) is the only reference to an American plant given by Linnaeus. That he could not have intended this as the primary constituent of *L. complanatum*, is shown not only by the preceding references to the European plant, but, furthermore, by his own descriptive phrase (in the uncompiled portion of the description) "spicis geminis." For while the common plant of Europe and extreme northern America has oftenest 2 (1 to 3) strobiles (spikes), the Alleghanian plant with "compact fan-like habit" usually has 4. Of the 88 peduncles of this form examined, 1 has 2 strobiles, 18 have 3, 65 have 4, 3 have 5, and 1 has 6, with an average of 4 strobiles, the "Lycopodium digitatum .... spicis *bigemellis*" of Dillenius.

These two forms of the species may be distinguished as follows:

L. COMPLANATUM, L. Branches with loosely and irregularly ascending branchlets very flat on the lower surface, 2 to 4 mm. wide, 0.5 to 1.2 dm. long, remotely forked, the simple terminal divisions much elongated, mostly 4 to 10 cm. long: peduncles 0.5 to 8 (average 3) cm. long, with 1 to 3 (very rarely more) strobiles.— Spec. ii. 1104 (excl. pl. Dill.); Druce, Jour. Bot. xx. 321, t. 233; Fl. Dan. xv. t. 2671. *L. complanatum*, form, Lloyd & Underwood, Bull. Torr. Club, xxvii. 164.— Northern Europe and Asia. In America from Exploits River, NEWFOUNDLAND (*Robinson & Schrenk*) and Davis Inlet, LABRADOR (*Sornborger*, no. 56x.) to Lake Lindeman, ALASKA (*Schwatka*, no. 21); south to Bald Head, Tobique River, NEW BRUNSWICK (*Hay*, no. 86), Grand Falls (*Robinson & Fernald*); Fort Kent, MAINE (*Williams, Robinson, & Fernald*), Island Falls (*Fernald*); upper Flathead River, MONTANA (*Canby*, no. 399); Lake Pend d'Oreille, IDAHO (*Heller*, no. 770). Occasional forms have the peduncle reduced or quite wanting, when the plant approaches *L. alpinum*. Such specimens may usually be distinguished from that species by the coarser and looser habit, broader and flatter branches, and longer strobiles.

Var. **flabelliforme**. Branches mostly spreading or recurved, flabelliform, 2.5 to 7 cm. long, the branchlets 1.5 to 3 mm. broad,

much forked, the simple terminal divisions 0.5 to 4 (average 2) cm. long: peduncles 3.5 to 10 (average 6.8) cm. long, with 1 to 6 (usually 4) strobiles. — *Lycopodium digitatum foliis Arboris Vitae, spicis bigemellis teretibus*, Dill. Hist. Musc. 448, t. 59. *L. complanatum*, L., l. c. (as to pl. Dill.), American authors and European authors, in part; Lloyd, Bull. Torr. Club, xxvi. 565; Lloyd & Underw. l. c. — MAINE, Island Falls, Sept. 26, 1901, Dover, July 17, 1896 (*M. L. Fernald*); Beech Hill, Mt. Desert Island, July 27, 1899 (*E. F. Williams*): NEW HAMPSHIRE, Jaffrey, July 9, 1897 (*B. L. Robinson*, no. 187): VERMONT, Manchester, July 16, 1898 (*M. A. Day*, no. 219): MASSACHUSETTS, Mt. Wachusett, Sept. 1896 (*W. W. Bailey*); Concord, Sept. 30, 1879 (*W. P. Rich*); North Reading, Sept. 4, 1882 (*C. E. Perkins*); Malden, Aug. 1878 (*H. A. Young*); Blue Hills Reservation, Sept. 11, 1898 (*F. G. Floyd*); Douglass, Oct. 25, 1893 (*J. F. Collins*): CONNECTICUT, Southington, Sept. 18, 1898 (*L. Andrews*, no. 494); reported from Nova Scotia to Ontario, Minnesota, and West Virginia.

GRAY HERBARIUM.

## THE HERBARIA OF NEW ENGLAND.

MARY A. DAY.

(Continued from page 262.)

**Seymour, Arthur Bliss,** WAVERLY, MASSACHUSETTS.— The phaenogams in Mr. Seymour's herbarium are kept at his home in Waverly and number about 3500 specimens, including nearly 2500 species with a geographical range covering nearly all the United States. The cryptogams in this collection number about 3500 species and are deposited in the rooms of the Cambridge Botanical Supply Company. The group of *Fungi* is best represented, being specially strong in the *Uredineae*, *Ustilagineae*, and *Erysipheae*, including specimens from different parts of the United States, Europe, Japan, and South Africa.

**Smith College,** NORTHAMPTON, MASSACHUSETTS.— In the herbarium at Smith College are about 6600 sheets nearly half of which are cryptogams. The cryptogamic part consists largely of purchased

sets of *Algae*, *Lichens*, and *Fungi*. The phaenogams are, in a great part, gifts of persons interested in the college and are from all parts of the world. The collection has been in existence twelve or thirteen years, and is now in charge of Professor W. F. Ganong.

**South Natick Historical, Natural History and Library Society,** South Natick, Massachusetts. — This society possesses a large number of plants which once belonged to Dr. J. W. Robbins of Uxbridge, Prof. J. L. Russell of Salem, Judge Clinton of Buffalo, and others including a collection of ferns from South India, Africa (Mountains of the Moon), Sandwich Islands, South America, etc., They are at present in the care of a botanist who is engaged in the work of mounting and classifying them with the purpose of rendering them available for reference.

**Springfield Botanical Society,** Springfield, Massachusetts. — The plants in this collection, numbering about 1000 specimens, are nearly all from the region around Springfield. Mrs. M. L. Owen has, however, contributed to it all her rarer plants of Nantucket, and it includes some of M. S. Bebb's willows and L. H. Bailey's *Carices*.

**Sturtevant, Edward Lewis.** Dr. Sturtevant made his collections along special lines, and it consisted very largely of cultivated plants. In the Garden Herbarium of Cornell University are his collections of *Cucurbitae* and the genus *Taraxacum*, also the material on which he founded his monograph of garden beans. Much of this collection now in possession of Cornell University consists of manuscript notes, extensive clippings, tracings of old drawings, and original paintings by his daughter. He gave his specimens of *Capsicum* to the Missouri Botanical Garden, but his collection of corn has been nearly if not entirely destroyed.

**Sullivant, William Starling,** see Harvard University, Cryptogamic Herbarium.

**Swan, Charles Walter,** Brookline, Massachusetts.— Dr. Swan's herbarium, consisting largely of phaenogams, contains 6400 sheets, representing 134 orders, and 902 genera. It has been collected during the past twenty years by exchange, purchase, and field work. A few hundred sheets represent foreign plants, 700 Canadian plants especially of the Rocky Mountains and the northwest, but the larger number contain plants of the United States, New England especially eastern Massachusetts claiming a majority of the specimens. The orders are arranged alphabetically and the genera under the

orders in the same way. Interest has been centered about the rushes, sedges, and grasses; 102 sheets represent the *Juncaceae*, 778 the *Cyperaceae* (of which 80 are *Cyperus* and 558 are *Carex*), and 1017 the *Gramineae*. Some of the other orders are represented as follows; *Compositae*, 691 sheets; *Filices*, 315 sheets; *Leguminosae*, 269 sheets; *Rosaceae*, 188 sheets; *Scrophulariaceae*, 159 sheets; *Labiatae*, 131 sheets; *Naiadaceae*, 122 sheets of which 109 are Potamogetons mostly purchased from Dr. Thomas Morong.

**Taylor, Thomas**, see Harvard University, Cryptogamic Herbarium.

**Terry, Emily Hitchcock**, NORTHAMPTON, MASSACHUSETTS.— Mrs. Terry's herbarium contains about 1600 specimens of flowering plants and ferns, and has been collected during the last fifteen years. The most important part is the collection of ferns, which represents all the species, with one exception, which are described in Gray's Manual, also many of more recent discovery. In addition Mrs. Terry has specimens of ferns from western and southern United States, the West Indies, Bermuda, Labrador, Iceland, Japan, India and the Hawaiian Islands.

**Thoreau, Henry David.**— At his decease Henry D. Thoreau bequeathed to the Boston Society of Natural history his herbarium excluding the *Carices*. The latter he gave to Mr. Edwin S. Hoar of Concord, Mass. After some years the Boston Society of Natural History gave the part in their possession to the town of Concord and it is now deposited in the Public Library. It consists of six large sized folios of about 100 sheets each, several specimens being mounted upon one sheet. The plants, which are arranged systematically have no labels, the names being written on the sheets often without further data, and sometimes with a pencil. Some Maine plants are included but Concord and its vicinity have the largest representation. In a written catalogue 750 species and varieties are recorded.

## EDITORIAL.

Two botanical journals have expressed surprise at the publication in our advertising pages of the Bangor and Aroostook notice. They have done so upon the not unnatural supposition that the plants

therein mentioned were being endangered by the publicity given to their haunts. We are glad to say, however, that the advertisement was cautiously drawn and, while giving an excellent idea of the richness of the Aroostook flora, assigns stations to no plant which is not to be found in quantities to supply the herbaria of the world without the smallest danger of extermination. To illustrate it may be said that the elsewhere infrequent *Aster Lindleyanus* is the prevalent Aster in some parts of northern Maine where it is actually fought as a weed by farmers. *Halenia deflexa*, known from but one station in Vermont and not yet collected in New Hampshire, is common and abundant through much of Aroostook County. The interesting *Oxytropis campestris*, var. *johannensis* covers the gravelly banks and shoals of the St. John river for many miles. The dwarf mistletoe, one of very few plants to which the advertisement assigns a precise station, is, notwithstanding its botanical interest, a timber pest, present in all too great abundance. *Drosera linearis*, elsewhere unknown east of Lake Superior, is widely distributed on "Caribou Bog" which is thirty miles long and ten miles wide. Did space permit, the other species mentioned in the advertisement could likewise be shown, through their abundance or wide diffusion in northern Maine, to be in no danger whatever. From the examples already given it will be clear that any comparison between such lingering survivals as Camptosorus in densely settled regions or near popular resorts on the one hand, and these plants luxuriating in 10,000 square miles of fertile plains, wide-reaching bogs, and pathless forests of sparsely settled northern Maine on the other, is purely specious — a matter of words not facts.

Considering the narrow limits within which the summer visitor now botanizes in certain classical collecting grounds on the White and Green Mountains, we can only express the hope that some part of the amateur collectors, who yearly visit these relatively restricted tracts of boreal and alpine flora, may through the influence of the advertisement be deflected to northern Maine, where, with a far greater opportunity to be of service to science, their collecting could have no serious influence upon the vegetation. Indeed, the flora of no other area east of the Rocky Mountains and south of British America seems to us less in need of concealment or special protection.

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